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# PREVENTING CRACKS IN NEW WOOD FLOORS

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# PREVENTING CRACKS IN NEW WOOD FLOORS

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The virtues of a well-laid and serviceable floor need no explanation to the modern American home owner. A good floor is its own best argument. It is easy to keep clean, and its appearance is an important part of the decorative scheme of the house interior. On the other hand, a floor that develops cracks and irregularities after laying is unsightly, it catches dust and dirt, creaks underfoot, and is a lasting source of exasperation and disappointment.

Cracks in a new floor do not usually appear until several months after the house is occupied, at which time it would hardly be practical to take the floor up, and relay it. The owner should, therefore, familiarize himself with the simple safeguards, which can be taken during the construction of the building, for preventing cracks.

Moreover, the floor is only a part of the interior woodwork, and the conditions that safeguard the laying of the floor also favor the production of a satisfactory job for the entire finish.

## The Cause of the Cracks

The cracks that develop within a few weeks or months in a new, well-laid floor are the result of a change in moisture content within the wood itself. This change in moisture content of the wood may be due to improper preliminary seasoning; improper storage conditions at the mill or retail yard; delivery to the building during wet weather or before the masonry or plaster walls are dry; or it may be due to the absorption of moisture from the air within the building either before or after the flooring is laid. The change in moisture content of the flooring as a result of the absorption of moisture from the air is the most serious cause of cracks, largely because its importance is not appreciated; hence little or no effort is made to guard against it. (Fig. 1.)

The well-informed manufacturer makes every effort to properly dry flooring stock before manufacture and to keep the flooring in proper condition as long as it is in his warerooms before shipment. He is careful, too, how it is stored in the freight car for delivery to the retail dealer.

Again, the properly equipped retail dealer usually stores this high-class product in well-constructed sheds, and as long as it is in his hands he takes care to see that it is not subjected to conditions that would allow it to absorb moisture. Eventually the house is ready for the flooring, which is then delivered to the job.

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[1] Maintained by the U. S. Department of Agriculture at Madison, Wis., in cooperation with the University of Wisconsin.

## Cracks in the Making

At this particular time, usually, the plastering has been finished, most of the trim is up, and the windows and exterior doors have been fitted and are in place.

It sometimes happens that the flooring is delivered on a damp day or even during rain, so that more or less moisture has been absorbed by the exposed boards in the bundles and in the ends of the stock. Laid in this condition, the flooring is bound to show gross irregularities in a short time.

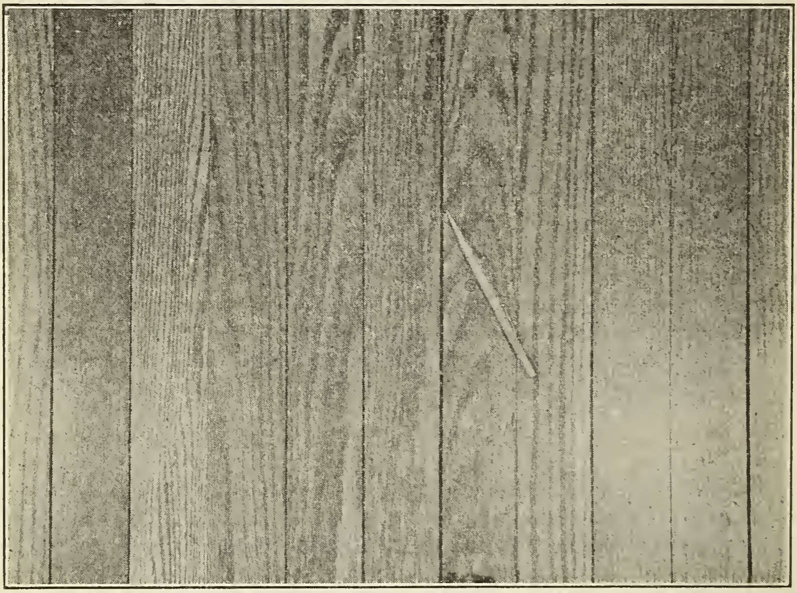

FIGURE 1.—The results of moisture absorption that occurred when the floor was newly laid. Compression set developed, and the cracks appeared after subsequent drying. They could have been prevented by heating the house to 70° F. until the floors were finished, and then by maintaining temperatures in the house comparable with those occurring during occupancy

Very bad results may also be expected if the flooring is laid or even stored inside the house before the plaster or masonry of the walls has had time to become thoroughly dry. The prudent owner will accept a delay in completion rather than let the contractor lay the flooring during that time.

But even without this type of more or less obvious exposure of the wood to moisture there is another type of exposure, less obvious but no less important. During the time of laying the floor, scraping it, and completing the other items. up to the time of occupancy, the general temperatures within the house both day and night are likely to be lower and the humidities higher than they would be in the same house if it were occupied. At this stage humidity means everything to the success of a good flooring job.

## Compression Set

Where a succession of damp days follows immediately after the floor is laid (fig. 2, A) and before the finish can be placed upon it, a very important pick-up in moisture content is likely to occur. The pick-up, of course, is very much slower after a floor has received even the first coat of its final finish.

Even a moderate absorption of moisture from the air is sufficient to cause a perceptible bulging of certain boards where they resist one another in the natural tendency to swell. Some crushing of wood fiber is bound to result from moisture increase in a tightly laid floor, and we are then face to face with the common cause of all or nearly all cracking, technically known as compression set. (Fig. 2, B.) If one were able to examine some well-laid flooring and see just how the edges go together, he would find that there is a relatively narrow edge that has to take the first results of the compression, though the whole board takes up some of the compression. After a board has once been in this compressed condition it never again completely recovers.

A second moisture change, in which a loss in moisture occurs, takes place after the house is occupied, particularly during the winter when the house is heated; at this time the average humidity is lower than it was during the construction period. Each board simply backs away from its neighbor (fig. 2, C), and the width of the crack is roughly equal to the amount of crushing or "set" the board suffered while at the higher moisture content. Any subsequent pressure contact between the boards as a result of moisture changes increases the amount of set and the width of the cracks as the wood again dries out. (Fig. 3.) Such pressure may occur during a period when the house is unoccupied or unheated for several weeks during cold or damp weather or from contact with foreign matter in the cracks. Another example of this process is the typical kitchen floor, in which repeated scrubbing causes the cracks to grow wider and wider as the floor grows older.

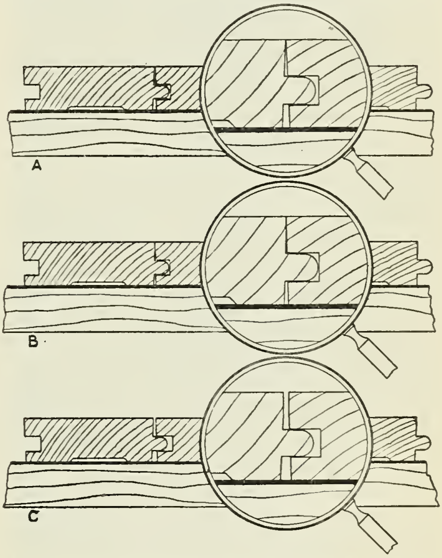

Figure 2.—How compression set makes cracks: A, Flooring when laid; B, the same flooring after it has absorbed moisture as a result of damp conditions in the unfinished house; C, the same flooring after subsequent drying. Note the permanent deformation of the inverted V-shaped joint and the comparatively wide crack

## Crooked Stock

Another cause of cracks in floors, also aggravated by moisture changes, is the use of boards that have considerable crook in them;

that is, boards that have bent edgewise. Slight crooking is of relatively little importance; but if the crook is so pronounced that considerable pressure must be applied to drive the board into place, three cracks are sure to appear sooner or later—one at each end of the board on one side and another along the middle portion of the board on the opposite side.

The method of manufacture makes it impossible to eliminate all such boards at the planing mill, because some crook develops after the stock has been bundled and is out of the manufacturers' hands. Where long boards are badly crooked, they should be used only in closets or other places where any cracking they may cause would not be conspicuous or important.

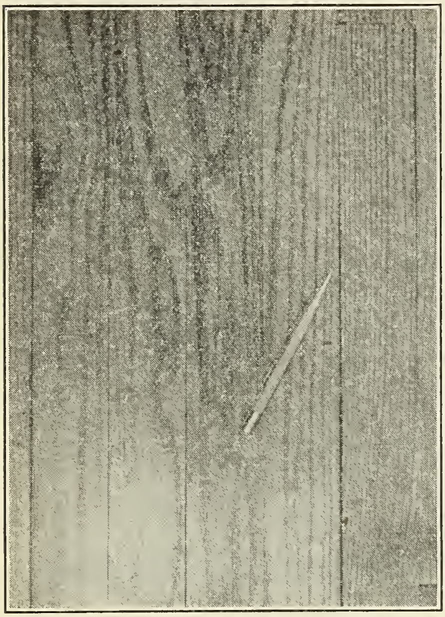

FIGURE 3.—The crook that came back to stay. Note the tight edge at the end of the board above the pencil point, the long crack below it, and the open space on the opposite edge of the board at its top end

## How to Prevent Floor Cracks

The cure for cracks in a floor lies wholly in preventing them. See to it that the floor it put down dry, and then see that moisture compression does not occur afterwards.

(1) Assure yourself that the dealer has properly protected the stock while it has been in his hands.

(2) Do not allow it to be delivered on a damp or rainy day.

(3) Make sure that the plaster or masonry walls are dry before the flooring is delivered.

(4) Eliminate all badly crooked boards or use them in inconspicuous places.

(5) Maintain heat in the house from the time the flooring is delivered until finished by the painter. The house interior should be maintained at least 15° F. above outdoor temperatures and should not be allowed to cool below, say, 70° during the summer or 62° to 65° when the outdoor temperatures are below freezing. While temperatures a little higher than this will do no harm, any severe overheating must be avoided. After receiving the protective coat of finish, temperatures comparable with those occurring in the house during occupancy should be maintained. Very little heat, of course, is required in warm, dry weather, but spells of damp or cool weather are likely to occur in any month in the year. Whenever possible the heating plant should be placed in the house before the interior trim goes in, in which event it will be available as a means of supplying the necessary heat.

Furthermore, the foregoing temperature conditions will tend to reduce the hazard of carelessness in the preliminary seasoning or storage of the flooring after manufacture. This is especially true if upon delivery the flooring bundles are broken and the stock spread out in the heated house for several days before it is laid.

An additional and very important reason for keeping down moisture in the house nearing completion is the fact that better and smoother floors are obtained with mechanical sanders when the floor and the atmosphere are dry.

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